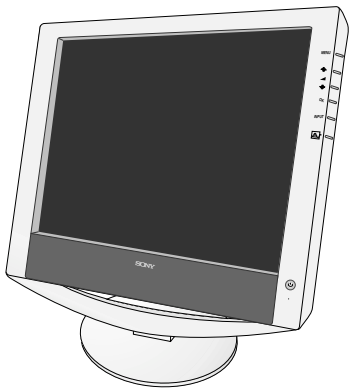
COLOR MONITOR
SERVICE MANUAL

MODEL: SDM-HX73, SDM-HX93 (U/C AEP Model)

CAUTION
BEFORE SERVICING THE UNIT,
READ THE **SAFETY PRECAUTIONS** IN THIS MANUAL.



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SPECIFICATIONS

1. LCD CHARACTERISTICS

Type	: TFT Color LCD Module
Size	: 17 inch**(SDM-HX73)**
	19 inch**(SDM-HX93)**
Pixel Pitch	: 0.264 (H) x 0.264 (V)**(SDM-HX73)**
	0.294 (H) x 0.294 (V)**(SDM-HX93)**
Color Depth	: 262K colors**(SDM-HX73)**
	16.7M colors**(SDM-HX93)**
Electrical Interface	: LVDS
Surface Treatment	: Haze 25%, Hard-coating(2H)
Operating Mode	: Normally White
Backlight Unit	: 4 CCFL **(SDM-HX73)**
	6 CCFL **(SDM-HX93)**

2. OPTICAL CHARACTERISTICS

2-1. Viewing Angle by Contrast Ratio ≥ 10

(SDM-HX73)

Left : -60° min., -70°(Typ) Right : +60° min., +70°(Typ)

Top :+60° min., +70°(Typ) Bottom : -60°min., -70°(Typ)

(SDM-HX93)

Left : -85° min. Right : +85° min.

Top :+85° min. Bottom : -85°min.

2-2. Luminance : 320(min), 370(Typ) **(SDM-HX73)**
: 310(min), 360(Typ) **(SDM-HX93)**

2-3. Contrast Ratio : 250(min), 450(Typ) **(SDM-HX73)**
: 400(min), 600(Typ) **(SDM-HX93)**

3. SIGNAL (Refer to the Timing Chart)

3-1. Sync Signal

• Type : Separate Sync,
Composite Sync, Digital

3-2. Video Input Signal

1) Type	: R, G, B Analog
2) Voltage Level	: 0~0.71 V
a) Color 0, 0	: 0 Vp-p
b) Color 7, 0	: 0.467 Vp-p
c) Color 15, 0	: 0.714 Vp-p
3) Input Impedance	: 75 Ω

3-3. Operating Frequency

Horizontal	: 28 ~ 80kHz (Digital: ~64kHz)
Vertical	: 48 ~ 75Hz (Digital: 60Hz)

4. Max. Resolution

Analog	: 1280 x 1024 / 75Hz
Digital	: 1280 x 1024 / 60Hz

5. POWER SUPPLY

5-1. Power : AC 100~240V, 50/60Hz , 1.0A

5-2. Power Consumption

MODE	H/V SYNC	VIDEO	POWER CONSUMPTION	LED COLOR
POWER ON (NORMAL)	ON/ON	ACTIVE	less than 50W**(SDM-HX73)**	GREEN
	ON/ON	ACTIVE	less than 60W**(SDM-HX93)**	
STAND-BY	OFF/ON	OFF	less than 1W	AMBER
SUSPEND	ON/OFF	OFF	less than 1W	AMBER
DPMS OFF	OFF/OFF	OFF	less than 1W	AMBER
POWER S/W OFF	-	-	less then 1W**(SDM-HX73)** - ***AUO Module***	
	-	-	less then 1W**(SDM-HX93)**	

6. ENVIRONMENT

6-1. Operating Temperature: 0°C~50°C

6-2. Relative Humidity : 5%~95% (Non-condensing)

6-3. MTBF : 50,000 Hours(Min)

7. DIMENSIONS (with TILT/SWIVEL)

(SDM-HX73)

Width	: 413.8 mm (16.3")
Depth	: 232.0 mm (9.13")
Height	: 418.3 mm (16.47")

(SDM-HX93)

Width	: 466.5 mm (18.37")
Depth	: 265.0 mm (10.43")
Height	: 468.0 mm (18.43")

8. WEIGHT (with TILT/SWIVEL)

(SDM-HX73)

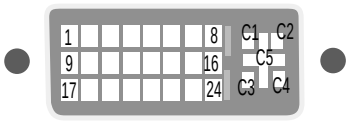
Net. Weight	: 6.5kg (14.33 lbs)
Gross Weight	: 9.0kg (19.84 lbs)

(SDM-HX93)

Net. Weight	: 8.5 kg (18.74 lbs)
Gross Weight	: 11.5kg (25.36 lbs)

Signal Connector Pin Assignment

• DVI-D Connector (Digital/Analog)



Pin	Signal (DVI-I)	Pin	Signal (DVI-I)
1	T. M. D. S. Data2-	16	Hot Plug Detect
2	T. M. D. S. Data2+	17	T. M. D. S. Data0-
3	T. M. D. S. Data2/4 Shield	18	T. M. D. S. Data0+
4	T. M. D. S. Data4-	19	T. M. D. S. Data0/5 Shield
5	T. M. D. S. Data4+	20	T. M. D. S. Data5-
6	DDC Clock	21	T. M. D. S. Data5+
7	DDC Data	22	T. M. D. S. Clock Shield
8	Analog Vertical Sync.	23	T. M. D. S. Clock+
9	T. M. D. S. Data1-	24	T. M. D. S. Clock-
10	T. M. D. S. Data1+	C1	Analog Red
11	T. M. D. S. Data1/3 Shield	C2	Analog Green
12	T. M. D. S. Data3-	C3	Analog Blue
13	T. M. D. S. Data3+	C4	Analog H. Sync.
14	+5V Power	C5	Analog Ground
15	Ground (return for +5V, H. Sync. and V. Sync.)		

T. M. D. S. (Transition Minimized Differential Signaling)

PRECAUTION

WARNING FOR THE SAFETY-RELATED COMPONENT.

- There are some special components used in LCD monitor that are important for safety. ***These parts are marked ⚠on the schematic diagram and the replacement parts list.*** It is essential that these critical parts should be replaced with the manufacturer's specified parts to prevent electric shock, fire or other hazard.
- Do not modify original design without obtaining written permission from manufacturer or you will void the original parts and labor guarantee.

TAKE CARE DURING HANDLING THE LCD MODULE WITH BACKLIGHT UNIT.

- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment person's body are grounded through wrist band.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- The module not be exposed to the direct sunlight.
- Avoid contact with water as it may a short circuit within the module.
- If the surface of panel become dirty, please wipe it off with a softmaterial. (Cleaning with a dirty or rough cloth may damage the panel.)

⚠ CAUTION

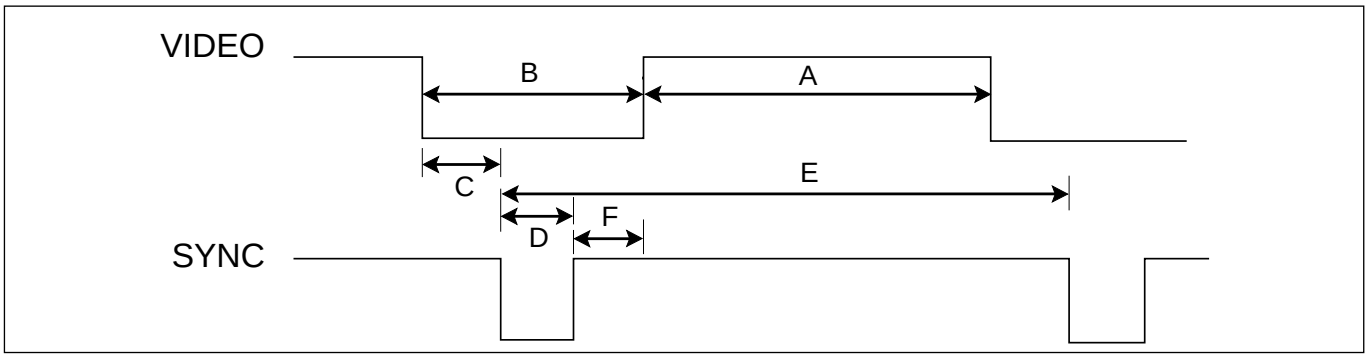
Please use only a plastic screwdriver to protect yourself from shock hazard during service operation.

⚠ WARNING

BE CAREFUL ELECTRIC SHOCK !

- If you want to replace with the new backlight (CCFL) or inverter circuit, must disconnect the AC adapter because high voltage appears at inverter circuit about 650Vrms.
- Handle with care wires or connectors of the inverter circuit. If the wires are pressed cause short and may burn or take fire.

TIMING CHART

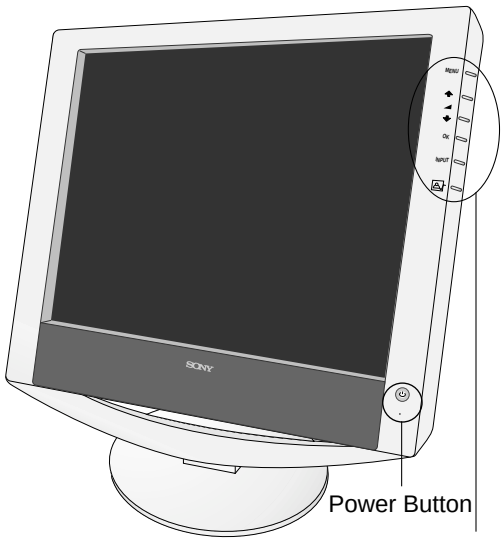


<< Dot Clock **(MHz),** Horizontal Frequency **(kHz)**, Vertical Frequency **(Hz)**, Horizontal etc... **(µs)**, Vertical etc... **(ms) >>**

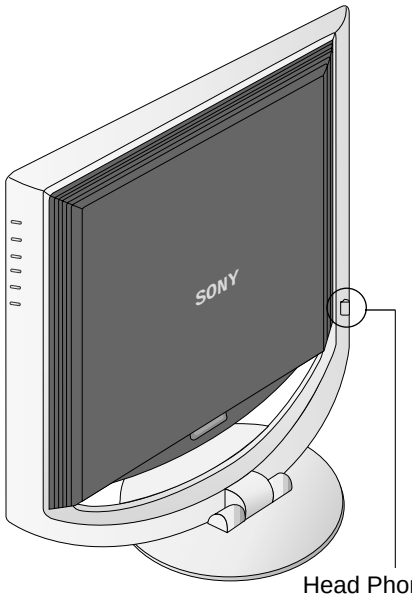
Mode	H/V Sort	Sync Polarity	Dot Clock	Frequency	Total Period (E)	Video Active Time (A)	Front Porch (C)	Sync Duration (D)	Back Porch (F)	Blanking time (B)	Resolution
1	H	–	28.350	31.500	900	720	180	108	54	18	**720x400**
	V	+		70.156Hz	449	400	49	3	34	12	**70Hz**
2	H	–	25.175	31.469	800	640	160	96	48	16	**640x480**
	V	–		59.940Hz	525	480	45	2	33	10	**60Hz**
3	H	–	30.240	35.00	864	640	224	64	96	64	**640x480**
	V	–		66.667Hz	525	480	45	3	39	3	**65Hz**
4	H	–	31.500	37.50	840	640	200	64	120	16	**640x480**
	V	–		75.0Hz	500	480	20	3	16	1	**75Hz**
5	H	–	31.505	35.162	896	720	176	40	102	34	**720x480**
	V	–		59.901Hz	587	480	107	2	93	12	**60Hz**
6	H	+-	36.000	35.156	1024	800	224	72	128	24	**800x600**
	V	+		56.250Hz	625	600	25	2	22	1	**56Hz**
7	H	+	40.000	37.879	1056	800	256	128	88	40	**800x600**
	V	+		60.317Hz	628	600	28	4	23	1	**60Hz**
8	H	+	50.000	48.077	1040	800	240	120	64	56	**800x600**
	V	+		72.188Hz	666	600	66	6	23	37	**72Hz**
9	H	+	49.500	46.875	1056	800	256	80	160	16	**800x600**
	V	+		75.0Hz	625	600	25	3	21	1	**75Hz**
10	H	–	57.285	49.727	1152	832	320	64	224	32	**832x624 (MAC16") 75Hz**
	V	–		74.553Hz	667	624	43	3	37	3	
11	H	–	65.000	48.363	1344	1024	320	136	160	24	**1024x768**
	V	–		60.004Hz	806	768	38	6	29	3	**60Hz**
12	H	–	75.000	56.476	1328	1024	304	136	144	24	**1024x768**
	V	–		70.069Hz	806	768	38	6	29	3	**70Hz**
13	H	+	78.750	60.023	1312	1024	288	96	176	16	**1024x768**
	V	+		75.029Hz	800	768	32	3	28	1	**75Hz**
14	H	–	80.000	60.241	1328	1024	304	96	176	32	**1024x768 (MAC19) 75Hz**
	V	–		74.927Hz	804	768	36	3	30	3	
15	H	+	108.000	67.500	1600	1152	448	128	256	64	**1152x864**
	V	+		75.000Hz	900	864	36	3	32	1	**75Hz**
16	H	–	100.000	68.681	1456	1152	304	128	144	32	**1152x870 (MAC21) 75Hz**
	V	–		75.062Hz	915	870	45	3	39	3	
17	H	–	92.940	61.795	1504	1152	352	128	194	30	**1152x900**
	V	–		65.950Hz	937	900	37	4	31	2	**66Hz**
18	H	–	105.590	71.732	1472	1152	320	96	208	16	**1152x900**
	V	–		76.068Hz	943	900	43	8	33	2	**75Hz**
19	H	+	46.200	31.216	1480	1170	310	129	144	37	**1170x584**
	V	+		50.026Hz	624	584	40	3	34	3	**50Hz**
20	H	+	108.000	60.000	1800	1280	520	112	312	96	**1280x960**
	V	+		60.000Hz	1000	960	40	3	36	1	**60Hz**
21	H	+	108.000	63.981	1688	1280	48	112	248	408	**1280x1024**
	V	+		60.020Hz	1066	1024	42	3	38	1	**60Hz**
22	H	+	135.000	79.976	1688	1280	408	144	248	16	**1280x1024**
	V	+		75.025Hz	1066	1024	42	3	38	1	**75Hz**

OPERATING INSTRUCTIONS

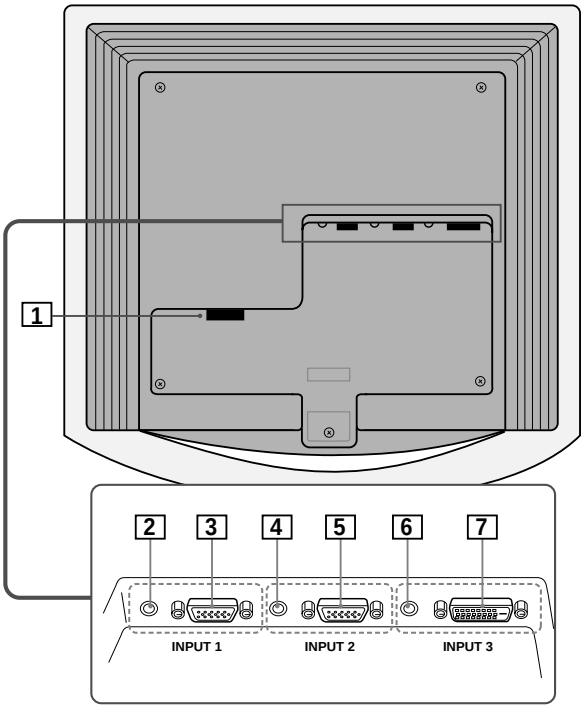
FRONT VIEW



SIDE VIEW



REAR VIEW



1. AC IN connector
This connector connects the power cord(suplied).

2. Audio input jack for INPUT1
This jack inputs audio signals when connected to the audio output jack of a computer or other audio epuipment connected to INPUT1.

3. HD15 input connector(anlog RGB) for INPUT1
This connector inputs analog RGB video signals (0.700Vp-p, positive)and sync signals.

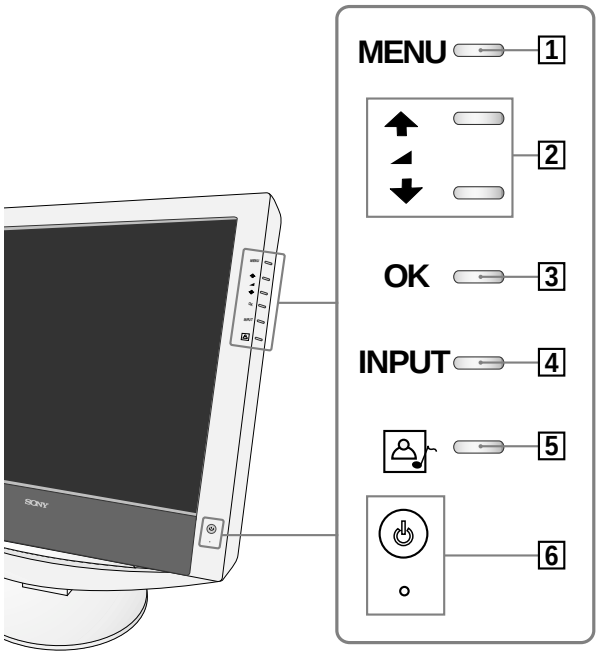
4. Audio input jack for INPUT2
This jack inputs audio signals when connected to the audio output jack of a computer or other audio epuipment connected to INPUT2.

5. HD15 input connector(anlog RGB) for INPUT2
This connector inputs analog RGB video signals (0.700Vp-p, positive)and sync signals.

6. Audio input jack for INPUT3
This jack inputs audio signals when connected to the audio output jack of a computer or other audio epuipment connected to INPUT3.

7. DVI-D input connector(digital RGB) for INPUT3
This connectot inputs digital RGB video signals that comply with DVI Rev.1.0.

Front Control Panel



1. MENU Button

This button turns the menu screen on and off.

2. ⇧/⇩ and ◿ (volume control) Buttons

These buttons are used to select the menu items and make adjustments, and also display the “Volume” menu to control the volume.

3. OK Button

This button activecfes the selected menu item and adjustments made using the ⇧/⇩ buttons(**2**).

4. INPUT Button

This button switches the video input signal between INPUT1, INPUT2 and INPUT3 when two computers are connected to the monitor.

5. Button

Use these buttons to choose or adjust items in the On Screen Display.

- MOVIE: For viewing movies
- PC: For viewing PC
- GAME: For viewing GAME
- AUTO: For viewing AUTO

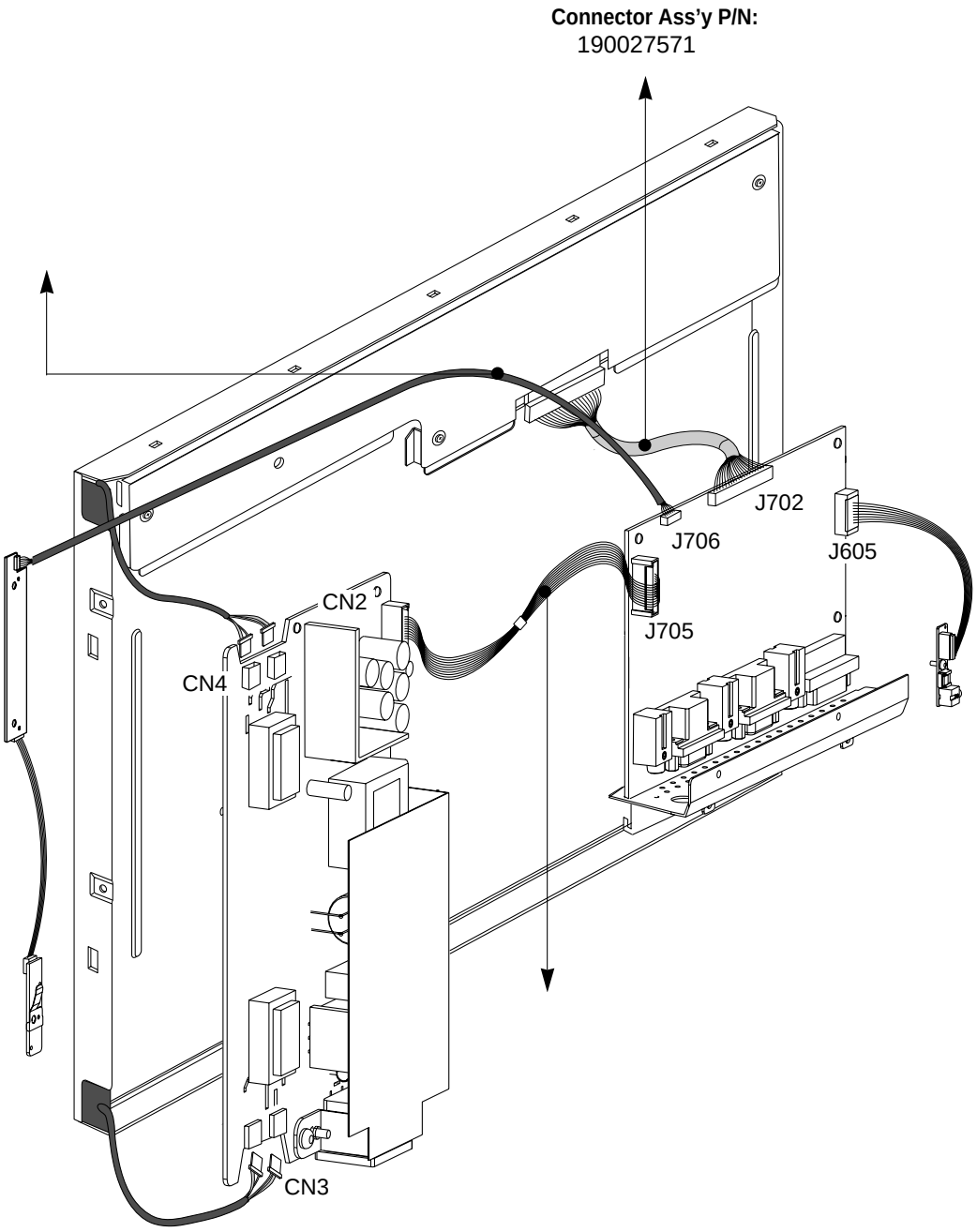
Establish brightness and light and darkness, color price in Menu according to environmental condition.(MOVIE/PC/GAME).

6. ⏻ (Power) switch and ⏻ (power) indicator

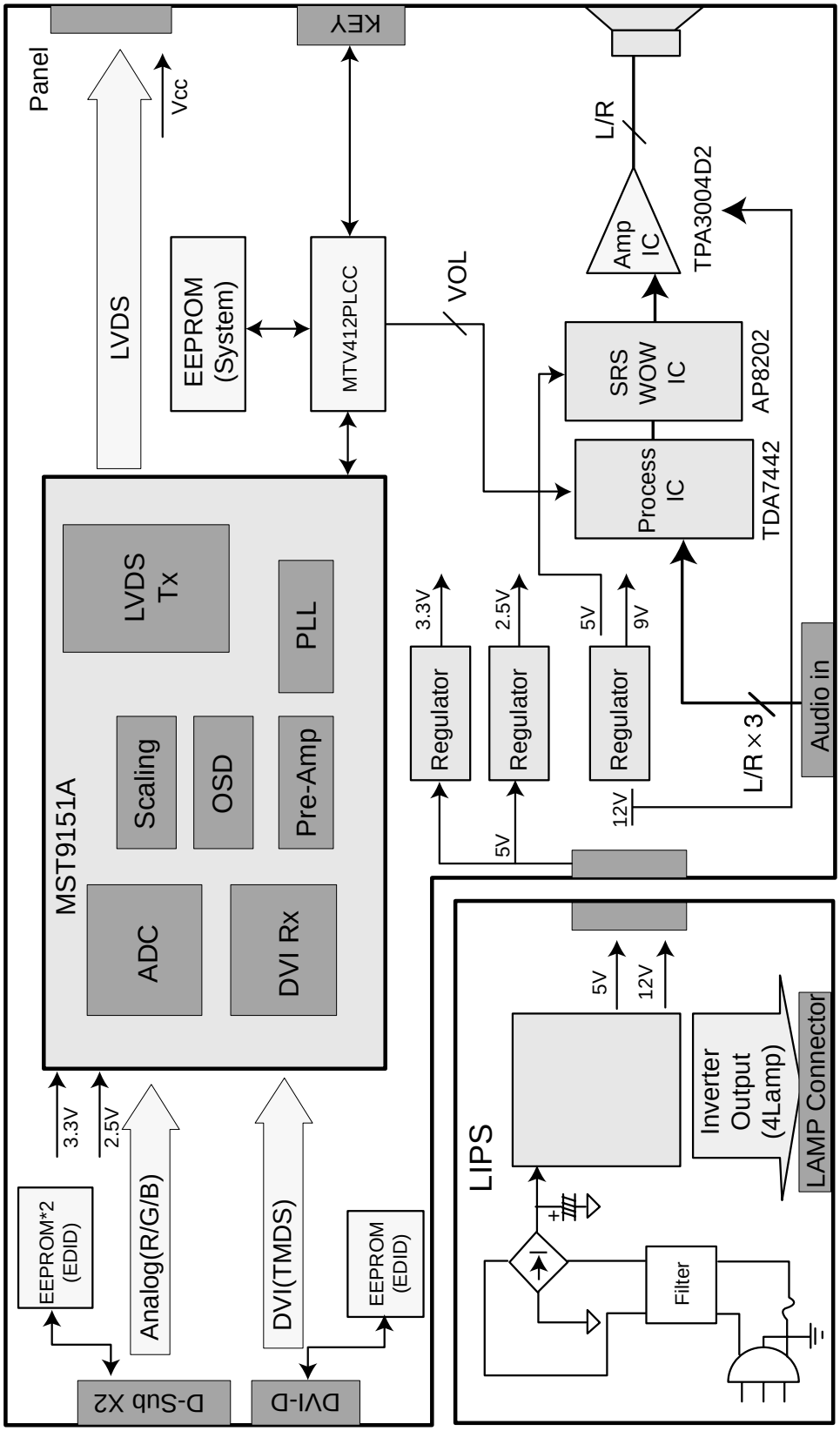
This switch turns the monitor on when the power indicator lights up in Green. To turn the monitor off, press this switch again.

If the power indicator does not light up, press the MAIN POWER switch.

WIRING DIAGRAM



BLOCK DIAGRAM



ADJUSTMENT

1. Procedures of how to go to service mode.

1) Enter the service mode of this unit by turning on the power while pressing and holding the " ↓ " key simultaneously.
2) Press "MENU" key----MAINTAIN.
3) Press "OK" key to enter the service menu.
4) Select the desired function.
5) Press the "MENU" key to exit OSD.
6) Turn off the power and then turn on it again. The monitor then enters the normal mode.
   To enter the service again, repeat the procedure described above.

Note

W/B readjustment is required after the panel, board and microcomputer are replaced. However, be sure to perform aging for more than 30 minutes for RGB reset before W/B adjustment.

2. Setup

1) Prepare timing and pattern data for a signal generator according to the Sony timing specifications.
2) Connect a monitor video cable to the signal generator.
3) Put Color Analyzer(ex. CA-110) 50cm away from the monitor, specify it vertically in the center of the display, and adjust the focus to the optimum level using an eyepiece.
4) Put the monitor and Color Analyzer(ex. CA-110) in a light-shielded room.
5) Set up [SERVICE MODE] of the monitor.

3. Operation

Data is manually set to improve the productivity. The brightness, contrast, and backlight are set to 50, 70 and 100 respectively. After that, the default data of the color temperature to be adjusted is set.

4. Warm up time

Warm up for 30 minutes before performing any adjustment.

5. Adjustment for White Balance

a. Display SMPTE at SXGA/60Hz(Input level 0.73V).
b. Set up [SERVICE MODE].
c. Click "INITIAL EEPROM" and again setup Service Mode.
d. Click "WHITE BALANCE" and then select "AUTO".

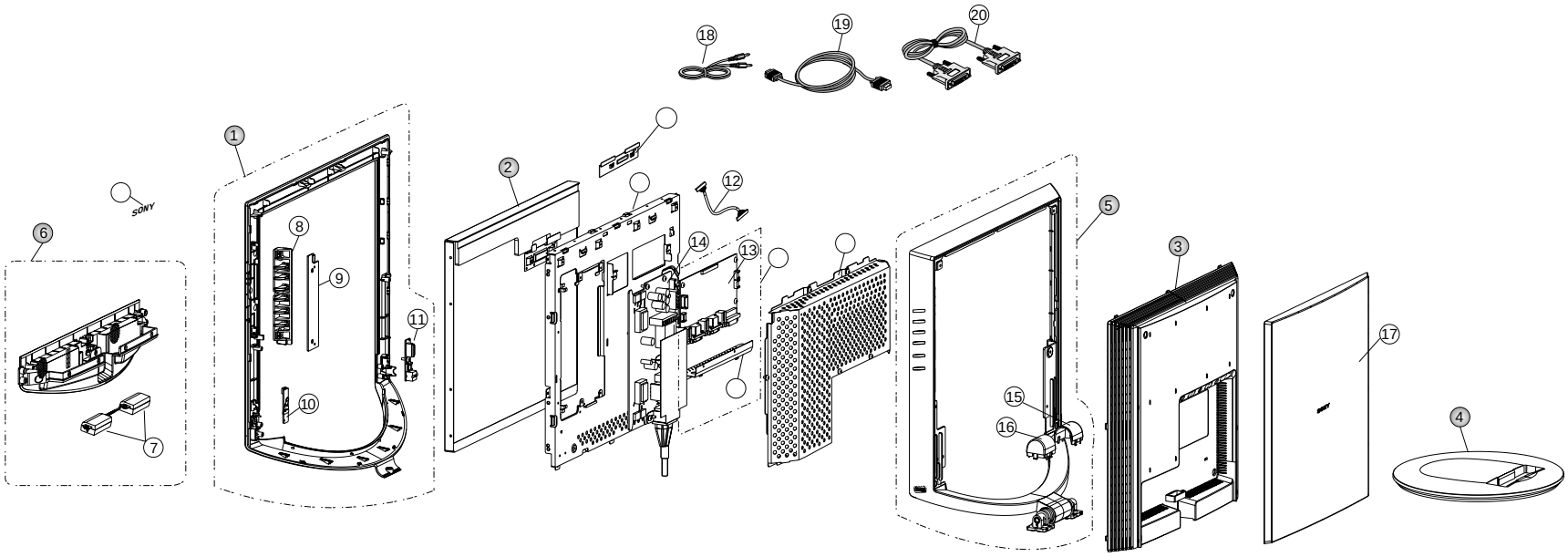
6. 9300K color adjustment

a. Select "9300K" in "COLOR TEMP" and enter.
b. Use a 35%(89Gray) IRE white video field in the primary mode.
c. Adjust "SUB CONTRAST " to secure the color temperature.
d. Press "MENU" key to exit adjust mode.

7. 6500K color adjustment

a. Select "6500K" in "COLOR TEMP" and enter.
b. Repeat the adjustment procedure as steps b to d at 9300K.

EXPLODED VIEW



EXPLODED VIEW PARTS LIST

Ref. No.	SONY Part No.	Description	LG PART NO.
1	X40422721	BEZEL ASSY (Silver), HX73	3091TKL089B
	X40423381	BEZEL ASSY (Black), HX73	3091TKL089A
	X40422671	BEZEL ASSY (Silver), HX93	3091TKL088B
	X40423411	BEZEL ASSY (Black), HX93	3091TKL088A
2	180548611	LCD PANEL, HX73	6304FAU010A
	180548511	LCD PANEL, HX93	6304FFT003A
3	409862501	REAR CABINET (Silver), HX73	3809TKL061B
	409862511	REAR CABINET (Black), HX73	3809TKL061A
	409860201	REAR CABINET (Silver), HX93	3809TKL060B
	409860211	REAR CABINET (Black), HX93	3809TKL060A
4	X40422711	STAND ASSY (Silver), HX73	3043TKK138B
	X40423371	STAND ASSY (Black), HX73	3043TKK138A
	X40422661	STAND ASSY (Silver), HX93	3043TKK137B
	X40423401	STAND ASSY (Black), HX93	3043TKK137A
5	409863101	MIDDLE COVER (Silver), HX73	3551TKK502B
	409863111	MIDDLE COVER (Black), HX73	3551TKK502A
	409860801	MIDDLE COVER (Silver), HX93	3550TKK411B
	409860811	MIDDLE COVER (Black), HX93	3550TKK411A
6	X40422731	SPEAKER FRONT COVER ASSY (Silver), HX73	3551TKS046B
	X40423391	SPEAKER FRONT COVER ASSY (Black), HX73	3551TKS046A
	X40422681	SPEAKER FRONT COVER ASSY (Silver), HX93	3551TKS045B
	X40423421	SPEAKER FRONT COVER ASSY (Black), HX93	3551TKS045A
7	182565511	SPEAKER	6401TZZ035A
8	409863501	FUNCTION KEY , HX73	4940TKT189A
	409861001	FUNCTION KEY , HX93	4940TKT190A
9	A1410344A	H1 MOUNT (PWB Assembly Control)	6871TST422A
10	A1410346A	U MOUNT (Head Phone Board), HX73	6871TST424A
	A1410348A	U MOUNT (Head Phone Board), HX93	6871TST421A
11	A1410345A	H2 MOUNT (Light sensor Board), HX73	6871TST423A
		H2 MOUNT (Light sensor Board), HX93	6871TST420A
12	190027571	CONNECTOR ASSY	6631T11016W
13	A1410342A	A MOUNT, HX73	3313TL7022B
		A MOUNT, HX93	3313TL9006A
14	A1410343A	G MOUNT , HX73	6871TPT251B
	A1410347A	G MOUNT , HX93	6871TPT252A
15	409864201	HINGE COVER(R) (Silver), HX73, HX93	3550TKK411B
	409864211	HINGE COVER (R) (Black), HX73, HX93	3550TKK411A
16	409864101	HINGE COVER (L) (Silver), HX73, HX93	3550TKK417B
	409864111	HINGE COVER (L) (Black), HX73, HX93	3550TKK417A
17	409862601	DOOR COVER (Silver), HX73	3550TKK409B
	409862611	DOOR COVER (Black), HX73	3550TKK409A
	409860301	DOOR COVER (Silver), HX93	3550TKK412B
	409860311	DOOR COVER (Black), HX93	3550TKK412A

ACCESSORIES & PACKING MATERIALS

Ref. No.	SONY Part No.	Description	LG PART NO.
18	182775911	AUDIO CABLE	6852TAZ006P
19	182775711	D-SUB CABLE	6850TD9004G
20	182808911	DVI CABLE	6866TDV004Q
	182806011	POWER-SUPPLY CORD SET (U/C)	6410TUW005A
	182801911	POWER-SUPPLY CORD SET (AEP)	6410TEW007A
	182851411	POWER-SUPPLY CORD SET (JAPAN)	6410TJW003E
	410235601	CD-ROM	3170TZ1253B
	409712911	QUICK SETUP GUIDE (U/C)	3828TUO207M
	409712901	QUICK SETUP GUIDE (AEP)	3828TUO207L
	409712921	QUICK SETUP GUIDE (JAPAN)	3828TUO207S
	410177401	LAMI BAG	3880TKZ017D
	409864901	CUSHION, HX73	3920TKP013B
	409862101	CUSHION, HX93	3920TKP014B
	409846302	INDIVIDUAL CARTON , HX73	3890TSE468A
	409846402	INDIVIDUAL CARTON , HX93	3890TSE469A

Sony EMCS Corporation Ichinomiya Tec Feb. 2004
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